

**Claim Amendments**

1. (Currently Amended) An apparatus comprising:

    a first node including a first end of a first channel and a first end of a second channel;

    a second node including a second end of a first channel and a second end of a second channel;

    a physical connection joining said first node and said second node through which signals of both said first channel and said second channel are carried; and

    a first controller connected to said first end of said first channel and a second controller connected to said a first end of said second channel, said first controller and said second controller being in communication and controlling interleaving of data from said two channels through said physical connection based on availability of valid data in said two channels to be transferred.

2. (Previously Presented) The apparatus according to claim 1, further comprising a third controller connected to the second end of the first channel and a fourth controller connected to the second end of the second channel, said third and fourth controllers being in communication with each other and obtaining information on whether the second ends of said two channels can accept more data.

3. (Previously Presented) The apparatus according to claim 2, said first controller and said third controller being in communication and said second controller and said fourth controller being in communication, said first and second controllers controlling the interleaving of data further based on said information.

4. (Original) The apparatus according to claim 1, said second node further comprising a queue for receiving data packets from said second end of said first channel and said second end of said second channel and for delivering said packets to a processor bus.

5. (Previously Presented) The apparatus according to claim 4, wherein said processor bus carries packets and said physical connection carries flits.

6. (Original) The apparatus according to claim 1, wherein said first node and said second node are connected by a second physical connection which carries both a third channel and a fourth channel.

7. (Previously Presented) A method, comprising:
  - determining availability of valid data in each of at least two channels, wherein said at least two channels share a physical connection to transfer data between a first node and a second node;
  - determining backpressure from a receiver of each channel; and
  - interleaving flits from said at least two channels along the physical connection based on said availability of valid data and said backpressure.
8. (Original) The method according to claim 7, further comprising reforming said flits into packets at the other end of said channels.
9. (Original) The method according to claim 8, further comprising storing said reformed packets in queues for transfer to a processor bus.
10. (Original) The method according to claim 9, wherein said processor bus transfers data in a different type of resource sharing paradigm than said physical connection.
11. (Previously Presented) The method according to claim 7, further comprising transferring said flits from each channel across the physical connection, in response to determining that valid data is unavailable in the other channel.

12. (Previously Presented) The method according to claim 7, further comprising transferring said flits from each channel across the physical connection, in response to determining that the other channel is receiving backpressure from the receiver.

13. (Previously Presented) A system comprising:  
a first node;  
a second node;  
at least one physical connection connecting said first node to said second node;  
a processor bus connected to said second node;  
a first data channel and a second data channel each having a first end in said first node and a second end in said second node, and both channels being carried by said physical connection; and  
said channels carrying data packets divided into flits, with flits from both channels being interleaved in said physical connection based on whether flits are available for a transfer.

14. (Previously Presented) The system according to claim 13, wherein one of said first and second data channels transfers flits on the physical connection, in response to determining that a flit being sent by the other data channel is the end of a packet.

15. (Previously Presented) The system according to claim 13, wherein flits are interleaved further based on whether a receiving end of each channel is able to receive more flits.

16. (Previously Presented) The system according to claim 15, wherein one of said first and second data channels utilizes the physical connection to transfer flits, in response to determining that the receiving end of the other data channel is unable to receive more flits.

17. (Currently Amended) An apparatus comprising:  
a first node including a first end of a first channel and a first end of a second channel;  
a second node including a second end of a first channel and a second end of a second channel;  
a physical connection joining said first node and said second node through which signals of both said first channel and said second channel are carried; and  
a first controller connected to said first end of said first channel and a second controller connected to said a first end of said second channel, said first controller and said second controller being in communication and controlling interleaving of data from said two channels through said physical connection based on whether the first and the second channels have valid data to be transferred.

18. (Previously Presented) The apparatus according to claim 17, wherein one of said first and second controllers sends data across said physical connection, in response to determining that only the channel connecting to the one controller has valid data.

19. (Previously Presented) The apparatus according to claim 17, wherein said first and second controllers controlling the interleaving of data further based on whether the first and second channels receives back pressure.

20. (Previously Presented) The apparatus according to claim 19, wherein one of said first and second controllers transfers data across said physical connection, in response to determining that the channel connecting to the other controller receives back pressure.

21. (Previously Presented) A method comprising:  
determining whether a first controller and a second controller have data to send, wherein the first and second controllers are connected to a channel; and  
in response to determining that only the first controller has data to send, sending data via the first controller.

22. (Previously Presented) The method according to claim 21, further comprising:  
determining which controller was the last one to send data.

23. (Previously Presented) The method according to claim 22, further comprising:

determining the first controller is starting to send a new packet, in response to determining that the first controller was the last one to send data.

24. (Previously Presented) The method according to claim 23, further comprising:

in response to determining that the new packet is absent, sending data via the second controller.

25. (Canceled)

26. (Previously Presented) The method according to claim 22, further comprising:

determining whether the second controller is starting to send a new packet, in response to determining that the second controller was the last one to send data.

27. (Previously Presented) The method according to claim 26, further comprising:

in response to determining that the second controller is starting to send a new packet, sending data via the second controller.